

SKYLAB-EREP QUARTERLY REPORT FOR PERIOD NOVEMBER 1974 - JANUARY 1975

GEOLOGICAL INVESTIGATIONS

1. Title - A study of the usefulness of Skylab EREP data for earth resources studies in Australia.
2. NASA HQ proposal identification number-SR 557.
3. Accomplishments - On 23/12/1974 the Australian Government Contractor for photographic processing supplied us with copies of the 2x enlargements from S190B photos, which had arrived in Australia on 28/11/1974.

This high quality early generation material was received when the study of the Canberra area was almost completed on previously received S190A photos. It was therefore decided to extend the study to include the assessment of that material.

The study of the Alice Springs area was commenced at a later date.

therefore it is based on the assessment of the 2x enlargements of the S190B photos, and the S190A material will be compared with it.

Positive transparencies of both areas were studied by using light tables and stereoscopes equipped with 3x binoculars.

All the photographs examined are from SL3. The SL4 photos have more extensive cloud cover.

4. Results - S190B enlargements are more suitable than S190A enlargements for the conventional photo-interpretation approach we are using.

4.1 Canberra test area

a) S190A photos

The area studied, about 18 000 km², is covered by the overlapping part of frames 180 and 181. First the colour photos were studied, then these were compared with photos in the other bands. Positive transparencies at 1:1 000 000 scale were used.

Lithological interpretation does not appear to be feasible on S190A photos because the landforms do not consistently reflect the underlying rock types and the resolution of the photos is not high enough to allow the use of other identification criteria.

Bedding strike and dips are not visible on the S190A photos. Some known faults appear to extend more than previously mapped; some new faults were detected. A comparison between faults detected on SKYLAB photos (A) and faults shown by the 1:250 000 scale geological map (B) has shown that:

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(E75-10124) A STUDY OF THE USEFULNESS OF
SKYLAB EREP DATA FOR EARTH RESOURCES STUDIES
IN AUSTRALIA Quarterly Report, Nov. 1974 -
Jan. 1975 (Bureau of Mineral Resources). 3 p
HC \$3.25

Unclass
CSCL 05B G3/43 00124

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|-------------------------------|----|
| Total number of faults in A: | 66 |
| Total number of faults in B: | 84 |
| Faults shown both by A and B: | 21 |
| Faults shown only by A: | 45 |
| Faults shown only by B: | 63 |

A statistical analysis was carried out of linear features that could be detected by the use of a stereoscope without magnification and with 3x magnification. Rosette diagrams were prepared showing the azimuth distribution of linear features for the total area and for various lithological types, as they appear in existing geological maps. Evaluation of the results is in progress.

Most linear features detected without magnification on SKYLAB photos had been detected on ERTS-1 transparencies examined with magnifying lenses of powers up to 6x. The SKYLAB linear features detected with 3x magnification are more abundant than those detected on ERTS.

b) S190B photos

The area studied, about 6800 km², is covered by the overlapping part of frames 144 and 145. Positive transparencies at 1:500 000 scale were used.

The evaluation has just started; more detail than on S190A photos is visible, particularly in fine drainage, linear features and rock texture. These elements allow in some places rock type discrimination.

4.2 Alice Springs test area

Photographs studied: SL3, S190B Roll 84 Frames 122, 123, 124, 125
2x enlargement.

The combination of arid environment, ancient land surface, and rock types of varying competence has resulted in the landforms of the region strongly reflecting the underlying rock type.

Fold structures and dipping sediments are clearly displayed and it is possible to interpret fold axial traces on S190B photography to an accuracy comparable with that shown on 1:250 000 scale geological maps. The direction of dip can be determined but dip values can only be grouped into broad categories.

Faults can be recognized where they displace rock types, but many of the faults shown on the 1:250 000 scale geological map are strike faults and thus cannot be interpreted on the Skylab photography.

Different rock types can be broadly subdivided and correlated although they cannot generally be classified into the same groups or formations that are shown on geological maps.

It is significant that in the region studied surficial Cainozoic and Tertiary materials can be readily interpreted. Various erosional/depositional landforms, chemical and unconsolidated materials can be mapped to an accuracy greater than is shown on the 1:250 000 scale map. This has some significance in mineral exploration since conglomeratic fan deposits and travertines of the region may contain concentrations of radioactive minerals, and these rock types can be reliably located on Skylab S190B colour photography.

5. The late arrival of high quality material has led to a re-assessment of the investigation program. The consequence is that the final report will be delayed for about two months.
6. Published articles - Nil
7. Recommendations - we recommend that the date for presentation of the final report be extended to 31/3/1975, to allow time to study recently received SKYLAB - EREP data.

Bureau of Mineral Resources,
Canberra, 4 February 1975

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